DONALD R. MACKAY Commercial Standard 181-52

Water-Resistant Organic Adhesives for Installation of Clay Tile

A RECORDED VOLUNTARY STANDARD OF THE TRADE

COMMODITY STANDARDS

Simplified Practice Recommendations and Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the Office of Industry and Commerce, Bureau of Foreign and Domestic Commerce, and with the National Bureau of Standards.

The purpose of Simplified Practice Recommendations is to eliminate avoidable waste through the establishment of standards of practice for stock sizes and varieties of specific commodities that currently are in general production and demand. The purpose of Commercial Standards is to establish standard methods of test, rating, certification, and labeling of commodities, and to provide uniform bases for fair competition.

The adoption and use of a Simplified Practice Recommendation or a Commercial Standard is voluntary. However, when reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, the provisions of the standard are enforceable through usual legal channels as a part of the sales contract.

A Simplified Practice Recommendation or a Commercial Standard originates with the proponent industry. The sponsors may be manufacturers, distributors, or users of the specific product. One of these three elements of industry submits to the Commodity Standards Division the necessary data to be used as the basis for developing a standard of practice. The Division, by means of assembled conferences or letter referenda, or both, assists the sponsor group in arriving at a tentative standard of practice and thereafter refers it to the other elements of the same industry for approval or for constructive criticism that will be helpful in making any necessary adjustments. The regular procedure of the Division assures continuous servicing of each effective Simplified Practice Recommendation and Commercial Standard, through review and revision, whenever, in the opinion of the industry, changing conditions warrant such action. Simplified Practice Recommendations and Commercial Standards are printed and made available by the Department of Commerce through the Government Printing Office and the Department of Commerce field offices.

UNITED STATES DEPARTMENT OF COMMERCE

Charles Sawyer, Secretary

U. S. DEPARTMENT OF COMMERCE

CHARLES SAWYER, Secretary

BUREAU OF FOREIGN AND DOMESTIC COMMERCE

Office of Industry and Commerce
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IN COOPERATION WITH

NATIONAL BUREAU OF STANDARDS

A. V. ASTIN, DIRECTOR

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Water-Resistant Organic Adhesives for Installation of Clay Tile

[Effective from July 12, 1952]

1. PURPOSE

1.1 The purpose of this Commercial Standard is to serve as a guide to manufacturers of water-resistant organic adhesives, tile producers, installing contractors, architects, and testing laboratories in producing, specifying, and testing organic adhesives for installation of clay tile. It provides a basis for clear understanding within the industry, and for guaranteeing the quality of organic adhesives.

2. SCOPE

2.1 This Commercial Standard covers water-resistant organic adhesives for installation of clay tile, and specifies minimum requirements and methods of test for stability in storage, shear strength under various temperatures and conditions of use, shear strength at intervals of time, cohesive strength immediately after application, solubility in water, and resistance to mold growths. It includes requirements for manufacturers' instructions for installation, labeling, and declaration of compliance with this standard.

3. DEFINITIONS

3.1 Clay tile for the purposes of this standard shall be a baked clay or ceramic product as described in the current edition of "The Tile Handbook," published by the Tile Council of America, 10 East Fortieth Street, New York, N. Y.

3.2 For the purposes of this standard the term "organic adhesive" shall include any adhesive in which an organic material is used as the principal bonding component.

4. REQUIREMENTS

4.1 *Stability in storage.*—After 4 weeks' storage under accelerated conditions as specified in 5.1, the adhesive shall not change appreciably in volume or viscosity; shall not segregate in such a manner that it cannot be restored readily by hand mixing; and shall have substantially the same working qualities as another sample of recent manufacture obtained from the manufacturer at that time.

4.2 *Shear strength.*—When the adhesive is tested in accordance with 5.2, it shall comply with the following requirements for shear strength:

4.2.1 Not less than 40 pounds per square inch when tested at 73.5° F in accordance with the method described in 5.2.4.1.

4.2.2 Not less than 30 pounds per square inch when tested at 125° F in accordance with the method described in 5.2.4.2.

4.2.3 Not less than 40 pounds per square inch when tested at −20° F in accordance with the method described in 5.2.4.3.

4.2.4 Not less than 40 pounds per square inch when tested immediately after immersion in water for 7 days in accordance with the method described in 5.2.4.4.

4.3 *Shear strength at intervals of time.*—When the adhesive is tested in accordance with 5.2.4.5, it shall attain the following strengths in shear:

4.3.1 Not less than 0.5 pound per square inch 16 hours after bonding.

4.3.2 Not less than 10 pounds per square inch 7 days after bonding.

4.3.3 Not less than 10 pounds per square inch 7 days after bonding and after an additional 7 days of immersion in water.

4.3.4 Not less than 40 pounds per square inch 28 days after bonding.

4.4 *Cohesive strength immediately after application.*—Bonding adhesives which are recommended for overhead application, when tested in accordance with 5.3 shall not allow the tile assembly to separate enough to permit the bottom tile to drop off within 24 hours.

4.5 *Solubility.*—The adhesive shall contain no ingredients that will noticeably discolor clear water when tested in accordance with the method described in 5.4. A white or milky cast in the test solution shall not be considered discoloration.[1]

4.6 *Resistance to mold growth.*—The adhesive shall not support mold growth when tested according to 5.5.

5. METHODS OF TEST

5.1 *Stability in storage.*—Four containers of at least 1 quart capacity of the bonding adhesive, received at the same time, shall be tested as follows:

The four containers shall be stored in a sheltered place for a 4-week period, 2 weeks at a temperature of 25° F and then 2 weeks at a temperature of 125° F. Any evidence of change in volume or viscosity shall be observed. At the end of the last storage period, after the containers have attained room temperature, if there is any evidence of segregation, the bonding adhesive shall be hand-mixed for not longer than 10 minutes with a paddle. The bonding adhesive in the containers, inspected at the end of the 4-week storage period, shall be compared with a sample of recent manufacture obtained from the manufacturer.

5.2 *Shear strength.*

5.2.1 *Materials.*—The materials used for test methods specified herein shall be as follows:

5.2.1.1 The clay tile shall be the commercial product, 4¼ by 4¼ inches, glazed on one side. For this test, the water absorption of the tile shall be within the range of 15 to 18 percent.

5.2.1.2 The bonding material shall be the commercial product, in quart or larger containers, as supplied for use by the manufacturer. A sufficient quantity of the bonding material shall be procured at one

[1] Staining of tile installations by an adhesive is a function of the opacity and porosity of the tile as well as the properties of the adhesive. To avoid stained installations, it is recommended that tile contractors, before installation, test the tile and adhesive to be used on the job by applying a 1/16-inch-thick layer between two pieces of tile, back to back, sealing the edges with cellophane tape such as "Scotch" tape. Allow to set for 24 hours and examine face for staining.

time to conduct all of the tests required in these specifications. Samples shall not be taken from any container more than 1 week after the original opening of the container. The lid shall be kept tightly closed on the container at all times when not removing samples.

5.2.2 *Preparation of bonded-tile assemblies.*

5.2.2.1 Bonded-tile assemblies for shear strength tests shall be prepared as follows: Clay tiles shall be bonded together in pairs with a bed of the adhesive approximately 1/16 inch thick, rib to rib. The bonding shall be done by placing a clay tile, with the unglazed side up, in a holder as shown in figure 1. Cylindrical metal spacers approximately 1 inch long, or other suitable spacers, shall be placed between the tile to insure a proper and uniform thickness of the adhesive of approximately 1/16 inch, rib to rib. A second tile shall be covered with a generous supply of the adhesive and pressed firmly against the spacers by hand so that the tile are parallel. The assembly holder shall be placed in a small press. The upper tile shall be protected by a wooden plate having the dimension of a tile, and a total load of about 40 pounds applied slowly until the excess bonding material is forced out. This pressure shall be maintained for 1 minute. The excess adhesive shall be scraped from the exposed edges, the assembly removed from the holder, and the spacers removed. As the assemblies are prepared with each tile overlapping an end of the other tile by 1/2 inch, a bonded area of about 16 square inches is obtained. Tile bonded in this manner shall be designated as bonded-tile assemblies in these specifications.

5.2.2.2 *Drying to constant weight.*—The bonded-tile assemblies shall be preconditioned at room temperature (approximately 73.5° ±5° F) for 24 hours and then dried to constant weight in a hot-air oven at 110° ±5° F. The tile assembly shall be considered to have reached constant weight when a 24-hour interval of continued drying results in an additional loss of less than 1 percent of the weight of the original mastic sample in the assembly, before preconditioning for 24 hours at room temperature (approximately 73.5° ±5° F).

5.2.2.3 *Conditioning.*—After drying to constant weight, and immediately prior to testing, the bonded-tile assemblies shall be conditioned in an atmosphere of 40 to 55 percent relative humidity and at a temperature of 73.5° ±5° F, for not less than 24 hours and not longer than 72 hours.

5.2.3 *Calculation of shear strength.*—In calculating shear strength, the load at failure of each of five assemblies subjected to a test shall be recorded and the average of the five readings taken for calculating the shear strength in pounds per square inch of the bonded area. Any individual readings which vary from the average by more than ±15 percent shall be discarded and not used for determining the shear strength. If less than three values remain for averaging, the test shall be rerun by using 10 bonded-tile assemblies. The average of these 10 values shall be taken as the shear strength, and none shall be discarded.

5.2.4 *Procedure.*

5.2.4.1 *Shear strength at 73.5° F.*—Five bonded-tile assemblies, prepared, dried, and conditioned in accordance with 5.2.2, shall be tested, in a vertical position, by compression loading at a rate of 0.50 inch per minute, so that the adhesive is stressed in shear. Failure of the material shall occur when the bond breaks suddenly or when the stress

causing deformation of the adhesive has reached a maximum value. If a tile breaks, the stress producing this failure shall not be used in computing the shear strength of the bonding material.

5.2.4.2 *Shear strength at 125° F.*—Five bonded-tile assemblies shall be prepared, dried, and conditioned in accordance with the method outlined in 5.2.2. These shall then be placed in a hot-air oven at 125° ±5° F, and left there for a period of 2 hours. Within 30 seconds following this treatment, they shall be tested in shear in accordance with the method described in 5.2.4.1 while at approximately oven temperature. The shear strength shall be calculated in accordance with the method outlined in 5.2.3.

5.2.4.3 *Shear strength at −20° F.*—Five bonded-tile assemblies shall be prepared, dried, and conditioned in accordance with the method described in 5.2.2. These shall then be cooled to −20° ±5° F, and held at this temperature for a period of 2 hours. Within 30 seconds following this treatment, they shall be tested in shear as directed in the method outlined in 5.2.4.1 while at approximately −20° ±5°F. The shear strength shall be calculated in accordance with the method described in 5.2.3.

5.2.4.4 *Shear strength, wet.*—Five bonded-tile assemblies shall be prepared, dried to constant weight, and conditioned in accordance

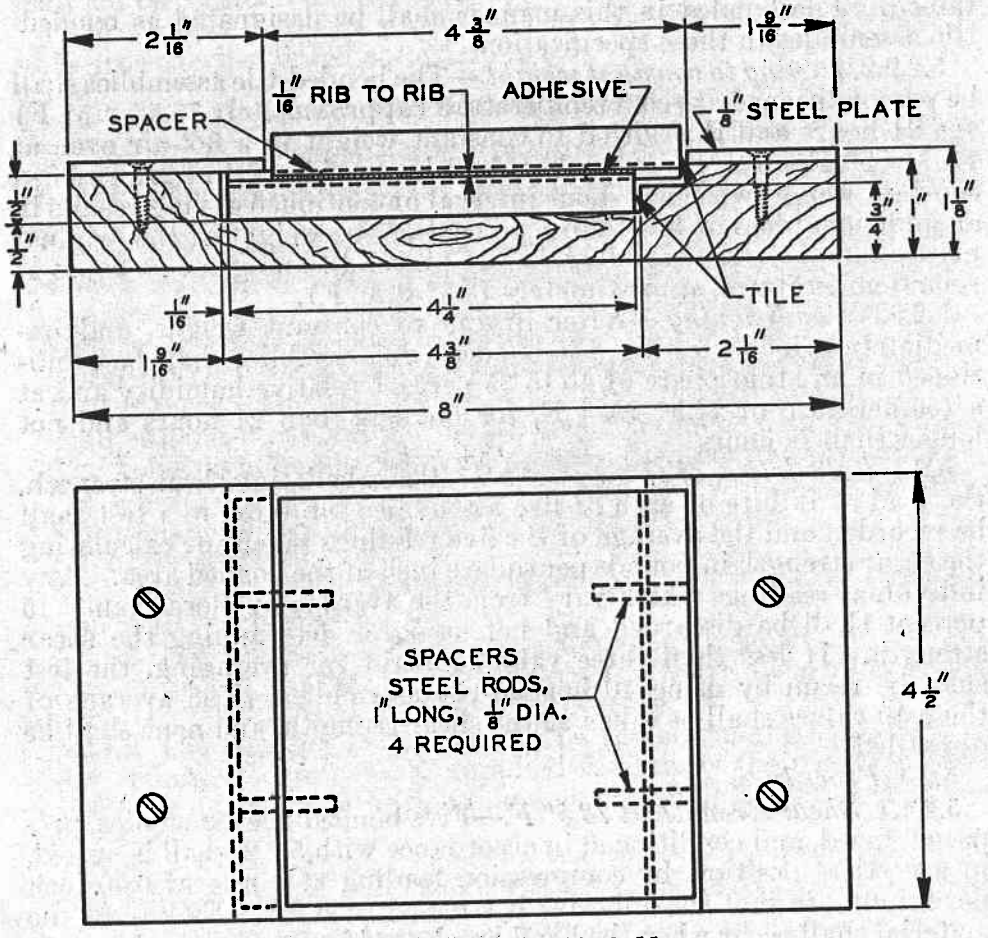

FIGURE 1. *Tile assembly holder.*

with the method outlined in 5.2.2, followed by immersion in water at 73.5° ±5° F for 7 days. The assemblies shall then be removed, wiped with a damp cloth, and within 30 seconds tested in shear in accordance with the method described in 5.2.4.1. The shear strength shall be calculated in accordance with the method described in 5.2.3.

5.2.4.5 *Shear strength at intervals of time.*—Twenty bonded-tile assemblies shall be prepared in accordance with the method outlined in 5.2.2.1. Five of these shall be aged for 16 hours, five for 7 days, five for 7 days in air plus 7 days in water, and the remaining five for 28 days—all at a temperature of 73.5° ± 5° F. They shall be tested in shear in accordance with the method described in 5.2.4.1, immediately after each respective aging period, and the strength computed in accordance with the method described in 5.2.3.

5.3 *Cohesive strength immediately after application.*—Test assemblies shall be prepared in the same manner as outlined in 5.2.2.1. Immediately after bonding, the assemblies shall be placed in a suspended horizontal position with the upper tile of the assembly being held by mechanical means.

5.4 *Solubility.*—Two grams of the fresh adhesive taken directly from the manufacturer's container shall be formed, as a layer approximately ¼ inch thick, around one end of a slender rod of a material not subject to corrosion by water or the adhesive (a glass rod ⅛ to ⅛ inch in diameter and 4 inches long is recommended). The adhesive on the rod shall be immediately lowered to the bottom of a glass test tube of 6-inch length and ¾-inch outside diameter, and 10 milliliters of distilled water, at a temperature of 73.5° ±5° F, added to cover the adhesive sample. The test tube shall be stoppered and stored undisturbed for a period of 10 days at 73.5° ±5° F.

5.4.1 Another test tube and rod assembly, but containing no adhesive sample, shall be prepared and stored at the same time for comparison. Observations shall be made daily, and any changes in the appearance of the water reported.

5.5 *Test for mold growth.*—The organism used for this test shall be *Aspergillus niger*. The culture medium shall be potato dextrose agar from Difco Products, Inc., of Detroit, Mich., or its equivalent. Dissolve 39 grams of the agar in 1 liter of water, using heat. Autoclave the medium at 15 pounds per square inch for 15 minutes. Cover one side of a 1-inch-square piece of tile with a ⅛-inch layer of adhesive. Place the coated tile with the adhesive side up in a sterile petri dish and pour sterile agar into the dish until the surface of the agar is level with the edge of the adhesive. Inoculate with the organism. Place the petri dish in an incubator at 28° to 30° C and at a relative humidity of 85 to 95 percent. After 14 days of incubation, examine to ascertain whether the adhesive supports mold growth.

6. DESIRABLE QUALITIES NOT SUSCEPTIBLE TO TEST

6.1 Other qualities of adhesives that should be considered but which cannot be readily specified are as follows:

(a) Adhesives shall be satisfactory for practical handling on the job. Surface skinning of the adhesive shall not occur too rapidly to allow proper bonding in accordance with the manufacturer's instructions.

(b) The adhesive shall not be food for vermin.

(c) Odor shall not be noticeable or disagreeable after the adhesive has once thoroughly dried out, through complete evaporation of the solvent, even though it should thereafter become damp.

7. MANUFACTURER'S INSTRUCTIONS

7.1 *Application.*—The container shall be clearly labeled. The necessary directions for application and the general instructions as shown below shall appear on the label or in a circular attached to the container:

Instructions for storage.
Instructions for practical handling on the job in reference to surface skinning time.
Types of tools to be used.
Solvent and methods of cleaning the tools and work.
Warnings of improper applications, conditions, and locations which may cause failure of the adhesive.

If solvents are suggested for thinning or cleaning tools or work, the necessary precautions shall be stated on the label to eliminate any hazard from their use.

7.2 *Storage.*—The manufacturer shall certify that the adhesives will meet the requirements of this specification within a period of not less than 1 year of storage in accordance with the manufacturer's instructions.

8. TOXICITY AND FLAMMABILITY

8.1 The adhesive shall not contain more than ½ of 1 percent of benzene or chlorinated hydrocarbon solvents. The labels on the containers shall state plainly, wherever required by law, any tendencies of the material to be toxic or irritating to the workman under normal application conditions, and any tendencies toward flammability; and shall set forth precautions to be observed for protection of the workman.

9. DECLARATION OF COMPLIANCE

9.1 In order that the purchaser may be assured that the product complies with this Commercial Standard, it is recommended that the following statement be included in labels, contracts, sales literature, invoices, etc.:

> This water-resistant organic adhesive for installation of clay tile complies with all requirements of Commercial Standard CS181–52, as developed by the trade under the procedure of the Commodity Standards Division, and issued by the U. S. Department of Commerce.

9.2 The standing committee has authorized the use of the hallmark shown in figure 2 to indicate compliance with the Commercial Standard.

10. EFFECTIVE DATE

10.1 Having been passed through the regular procedure of the Commodity Standards Division, and approved by the acceptors hereinafter listed, this commercial standard was issued by the United States Department of Commerce, effective from July 12, 1952.

EDWIN W. ELY,
Chief, Commodity Standards Division.

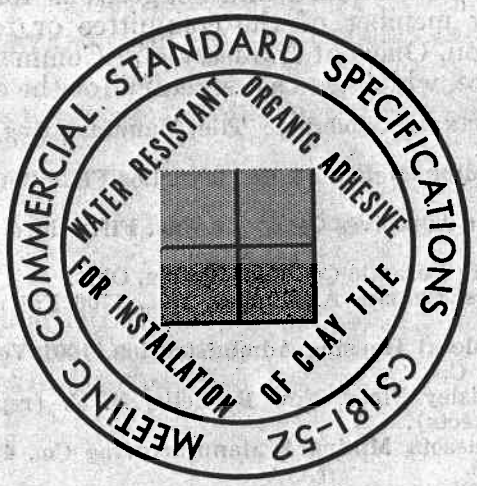

FIGURE 2. *Hallmark.*

HISTORY OF PROJECT

In a letter dated June 15, 1950, the Tile Council of America, through Charles H. Burchenal, chairman of the Research Committee, requested the cooperation of the Commodity Standards Division in the establishment of a Commercial Standard for water-resistant organic adhesives for installation of clay tile.

The Tile Council of America submitted to the Commodity Standards Division a report of research on adhesives conducted for the Council by the Battelle Memorial Institute, and a tentative draft of a proposed Commercial Standard was prepared in accordance with the information contained in that report. Two meetings of the Research Committee were held to adjust the tentative draft, and the committee was expanded to include representatives of tile contractors, architects, and the Federal Housing Administration.

The adjusted draft was circulated on January 8, 1951, to a comprehensive group of adhesive manufacturers, tile manufacturers, tile contractors, testing laboratories, and Government agencies for constructive comment. The comments that were received were considered by the committee at a meeting held on March 19, at which time the draft was adjusted in agreement with majority viewpoint.

The draft as adjusted by the committee on March 19, 1951, was circulated as a recommended Commercial Standard for written acceptance on June 8, 1951.

On June 12, 1952, acceptances having been received representing a satisfactory volume of production, the establishment of the standard, designated CS181–52, was announced, effective from July 12, 1952.

Project Manager: F. W. Reynolds, assisted by H. A. Bonnet—Commodity Standards Division, Office of Industry and Commerce.
Technical Adviser: F. W. Reinhart, Organic and Fibrous Materials Division, National Bureau of Standards.

STANDING COMMITTEE

The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Com-

ment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, Office of Industry and Commerce, U. S. Department of Commerce, which acts as secretary for the committee.

CHARLES H. BURCHENAL, Cambridge Tile Manufacturing Co., Cincinnati 15, Ohio (Chairman).

W. O. BRANDT, Gladding, McBean & Co., 2901 Los Feliz Boulevard., Los Angeles 26, Calif.

L. R. CUTLER, Miracle Adhesives Corp., 214 East Fifty-third Street, New York 22, N. Y.

PAUL HERBERT, Sparta Ceramic Co., East Sparta, Ohio.

CHARLES A. KLINGES, Charles A. Klinges, Inc., 1706 Fairmont Avenue, Philadelphia, Pa.

W. J. O'CONNOR, Federal Housing Administration, 1001 Vermont Avenue NW., Washington 25, D. C.

BEN J. SMALL, 5 Risley Place, New Rochelle, N. Y. (representing American Institute of Architects).

L. F. WEYAND, Minnesota Mining & Manufacturing Co., 411 Piquette Avenue, Detroit 2, Mich.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date_____

Commodity Standards Division,
Office of Industry and Commerce,
U. S. Department of Commerce,
Washington 25, D. C.

Gentlemen:

We believe that Commercial Standard 181–52, Water-Resistant Organic Adhesives for Installation of Clay Tile, constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable as an

☐ Adhesive manufacturer [1]
☐ Tile manufacturer [1]
☐ Tile contractor [1]
☐ Adhesive distributor [1]
☐ Architect [1]
☐ Testing laboratory [1]

We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

(Cut on this line)

Signature of authorized officer_____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer_____

Organization_____
(Fill in exactly as it should be listed)

Street address_____

City, zone, and State_____

[1] Check the one that applies. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard, where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or of the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, testing, purchase, or use of water-resistant organic adhesives for installation of clay tile. In accepting the standard they reserved the right to depart from it as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

FIRMS AND OTHER INTERESTS

Albre Marble & Tile Co., Inc., Dorchester, Mass.
Allied Analytical & Research Laboratories, Dallas, Tex.
American Encaustic Tiling Co., Inc., Lansdale, Pa.
American Mosaic & Tile Co., Inc., Louisville, Ky.
Andrews, Jones, Biscoe & Goodell, Boston, Mass.
Arabol Manufacturing Co., The, New York, N. Y.
Architectural Tiling Co., Inc., New York, N. Y.
Art Stone & Tile Co., Wilmington, Del.
Associated Tile & Marble Co., Albany, N. Y.
Atlantic Tile Manufacturing Co., Matawan, N. J.
Atlas Tile Co., Philadelphia, Pa.
Brust & Brust, Milwaukee, Wis.
Butler & Son Co., Milwaukee, Wis.
Cambridge Tile Manufacturing Co., The, Cincinnati, Ohio.
Camlet, J. Thomas, Passaic, N. J.
Carlyle Tile Co., The, Ironton, Ohio.
Carter, G. W., Tile Co., Kinston, N. C.
Cellarius, Charles F., Cincinnati, Ohio.
Central of Georgia Railway Co., Savannah, Ga.
Commercial Tile Corp., Brooklyn, N. Y.
Conrad & Cummings, Binghamton, N. Y.
Coolidge, Shepley, Bulfinch & Abbott, Boston, Mass.
Crowell & Lancaster, Bangor, Maine.
Crowner, R. L., Tile Co., Toledo, Ohio.
Dale Tile Co., Minneapolis, Minn.
Dallas Ceramic Co., Dallas, Tex.
Daniels Tile Co., Birmingham, Ala.
Des Moines Marble & Mantel Co., Des Moines, Iowa.
Drake Tile & Mosaic Co., Detroit, Mich.
Ekroth Laboratories, Inc., Brooklyn, N. Y.
Erath, Wm., & Son, Inc., Brooklyn, N. Y.
Federal Adhesives Corp., Brooklyn, N. Y.
Flannagan, Eric G., Henderson, N. C.
Gates, F. E., Marble & Tile Co., Indianapolis, Ind.
General Tile Corp., El Segundo, Calif.
Gerstner & Statt, Rochester, N. Y.
Gladding, McBean & Co., Los Angeles, Calif.
Hood, B. Mifflin, Co., Daisy, Tenn.
Interstate Marble & Tile Co., Miami, Fla.
Jordan Tile Manufacturing Co., Corona, Calif.
Klinges, Charles A., Inc., Philadelphia, Pa.
Latenser, John, & Sons, Omaha, Nebr.
Law, Law, Potter & Nystrom, Madison, Wis.
Lehigh Tile & Marble Co., Allentown, Pa.
Loeb, Laurence M., White Plains, N. Y.
Long Island Distributors, Long Island City, N. Y.
Macy, R. H., & Co., Inc., New York, N Y.
Marbleithic Co., The, Dayton, Ohio.
Marus Marble & Tile Co., Inc., Greensboro, N. C.
Master Tile Co., Baltimore, Md.
Mills & Hinz Tile Co., San Francisco, Calif.
Minnesota Mining & Manufacturing Co., Detroit, Mich.
Miracle Adhesives Corp., New York, N. Y.
Mooser, William, San Francisco, Calif.
Morgan, W. H., Co., Cohoes, N. Y.
Morse Laboratories, Sacramento, Calif.
Mosaic Tile Co., The, Zanesville, Ohio.
Muhlenberg Bros., Wyomissing, Pa.
Muller & Vail Tile Co., Stockton, Calif.
Murray Tile Co., Inc., Cloverport, Ky.
National Tile & Manufacturing Co., Anderson, Ind.
National Tile & Marble Corp., New York, N. Y.
New York Testing Laboratories, Inc., New York, N. Y.
Ohio Adhesives Corp., New Philadelphia, Ohio.
Olean Tile Co., Olean, N. Y.
Omaha Testing Laboratories, Omaha, Nebr.
Orthmann Laboratories, Inc., The, Milwaukee, Wis.
Pacific Clay Products, Los Angeles, Calif.
Pacific Tile & Porcelain Co., Paramount, Calif.
Patzig Testing Laboratories, Des Moines, Iowa.
Pehrson, G. A., & Associates, Spokane, Wash.
Perfection Paint & Color Co., Indianapolis, Ind.
Polytechnique Laboratories, Ozone Park, N. Y.
Pomona Tile Manufacturing Co., Los Angeles, Calif.
Prospect Marble & Tile Co., Cleveland, Ohio.
Queen Mantel & Tile Co., Atlanta, Ga.
Resnikoff, Abraham, New York, N. Y.
Rinaldi Tile Co., Inc., Cambridge, Mass.
Robertson Manufacturing Co., Morrisville, Pa.
Robinson Tile & Marble Co., Seattle, Wash.
Selby, Battersby & Co., Baltimore, Md.
Southern Mosaic Tile Factory, Weslaco, Tex.
Southern Testing Laboratories, Inc., Birmingham, Ala.
Southwest Tile Co., San Antonio, Tex.
Sparta Ceramic Co., The, East Sparta, Ohio.
Standard Tile Co., Chattanooga, Tenn.
Stearns & Bergstrom, Inc., Syracuse, N. Y.
Stoetzel, Ralph, Chicago, Ill.
Stokes Interiors, Inc., Jackson, Miss.
Summitville Tiles, Inc., Summitville, Ohio.
Taylor, Ellery Kirke, Haddonfield, N. J.
Thal, Nelson E., Toledo, Ohio.
Tremco Manufacturing Co., The, Cleveland, Ohio.
Twin City Testing & Engineering Laboratory, St. Paul, Minn.
Union Paste Co., Hyde Park, Mass.

United States Quarry Tile Co., Canton, Ohio.
United States Testing Co., Inc., Hoboken, N. J.
United Tile Co., Inc., Waco, Tex.
Virginia Polytechnic Institute, Department of Architecture, Blacksburg, Va.
Walsh, Louis A., Waterbury, Conn.
Warner, Earle B., Inc., New Haven, Conn.
Watts, Wm. H., & Co., Philadelphia, Pa.
Welch, Carroll E., Huntington, N. Y.
Wenczel Tile Co., Trenton, N. J.
Winburn Tile Manufacturing Co., Little Rock, Ark.
Zimmerman, A. C., Los Angeles, Calif.

UNITED STATES GOVERNMENT

Department of the Army, Office of Assistant Chief of Staff, Washington, D. C.

COMMERCIAL STANDARDS

CS No.

0. Commercial standards and their value to business.
1. Clinical thermometers.
2. Mopsticks.
3. Stoddard solvent.
4. Staple porcelain (all-clay) plumbing fixtures.
5. Pipe nipples; brass, copper, steel and wrought-iron.
6. Wrought-iron pipe nipples. Superseded by CS5.
7. Standard weight malleable iron or steel screwed unions.
8. Gage blanks.
9. Builders' template hardware.
10. Brass pipe nipples. Superseded by CS5.
11. Moisture regains of cotton yarns.
12. Fuel oils.
13. Dress patterns.
14. Boys' sport and dress shirt (woven fabrics) size measurements.
15. Men's pajama sizes (made from woven fabrics).
16. Wallpaper.
17. Diamond core drill fittings.
18. Hickory golf shafts.
19. Foundry patterns of wood.
20. Vitreous china plumbing fixtures.
21. Interchangeable ground-glass joints, stopcocks, and stoppers.
22. Builders' hardware (nontemplate).
23. Feldspar.
24. Screw threads and tap-drill sizes.
25. Special screw threads. Superseded by CS24.
26. Aromatic red cedar closet lining.
27. Mirrors.
28. Cotton fabric tents, tarpaulins and covers.
29. Staple seats for water-closet bowls.
30. (Withdrawn.)
31. Wood shingles.
32. Cotton cloth for rubber and pyroxylin coating.
33. Knit underwear (exclusive of rayon).
34. Bag, case, and strap leather.
35. Hardwood plywood.
36. Fourdrinier wire cloth.
37. Steel bone plates and screws.
38. Hospital rubber sheeting.
39. (Withdrawn.)
40. Surgeons' rubber gloves.
41. Surgeons' latex gloves.
42. Structural fiber insulating board.
43. Grading of sulphonated oils.
44. Apple wraps.
45. Douglas fir plywood.
46. Hosiery lengths and sizes.
47. Marking of gold-filled and rolled-gold-plate articles other than watchcases.
48. Domestic burners for Pennsylvania anthracite (underfeed type).
49. Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50. Binders board for bookbinding and other purposes.
51. Marking articles made of silver in combination with gold.
52. Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53. Colors and finishes for cast stone.

CS No.

54. Mattresses for hospitals.
55. Mattresses for institutions.
56. Oak flooring.
57. Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings.
58. Woven elastic fabrics for use in overalls (overall elastic webbing).
59. Textiles—testing and reporting.
60. Hardwood dimension lumber.
61. Venetian blinds (grade A, custom-made).
62. Colors for kitchen accessories.
63. Colors for bathroom accessories.
64. Walnut veneers.
65. Methods of analysis and of reporting fiber composition of textile products.
66. Marking of articles made wholly or in part of platinum.
67. Marking articles made of karat gold.
68. Liquid hypochlorite disinfectant, deodorant, and germicide.
69. Pine oil disinfectant.
70. Phenolic disinfectant (emulsifying type) (published with CS71).
71. Phenolic disinfectant (soluble type) (published with CS70).
72. Household insecticide (liquid spray type).
73. Old growth Douglas fir, Sitka spruce, and western hemlock standard stock doors.
74. Solid hardwood wall paneling.
75. Automatic mechanical draft oil burners designed for domestic installations.
76. Hardwood interior trim and molding.
77. Enameled cast-iron plumbing fixtures.
78. Ground-and-polished lenses for sun glasses (published with CS79).
79. Blown, drawn, and dropped lenses for sun glasses (published with CS78).
80. Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81. Adverse-weather lamps for vehicles (after market).
82. Inner-controlled spotlamps for vehicles (after market).
83. Clearance, marker, and identification lamps for vehicles (after market).
84. Electric tail lamps for vehicles (after market).
85. Electric license-plate lamps for vehicles (after market).
86. Electric stop lamps for vehicles (after market).
87. Red electric warning lanterns.
88. Liquid burning flares.
89. Hardwood stair treads and risers.
90. Power cranes and shovels.
91. Factory-fitted Douglas fir entrance doors.
92. Cedar, cypress, and redwood tank stock lumber.
93. Portable electric drills (exclusive of high frequency).
94. Calking lead.
95. Lead pipe.
96. Lead traps and bends.
97. Electric supplementary driving and passing lamps for vehicles (after market).
98. Artists' oil paints.

CS No.

99. Gas floor furnaces—gravity circulating type.
100. Porcelain-enameled steel utensils.
101. Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
102. (Reserved for "Diesel and fuel-oil engines.")
103. Rayon jacquard velour (with or without other decorative yarn).
104. Warm-air furnaces equipped with vaporizing-type oil burners.
105. Mineral wool insulation for low temperatures.
106. Boys' pajama sizes (woven fabrics).
107. (Withdrawn.)
108. Treading automobile and truck tires.
109. Solid-fuel-burning forced-air furnaces.
110. Tire repairs—vulcanized (passenger, truck, and bus tires).
111. Earthenware (vitreous-glazed) plumbing fixtures.
112. Homogeneous fiber wallboard.
113. Oil-burning floor furnaces equipped with vaporizing pot-type burners.
114. Hospital sheeting for mattress protection.
115. Porcelain-enameled tanks for domestic use.
116. Bituminized-fibre drain and sewer pipe.
117. Mineral wool insulation for heated industrial equipment.
118. Marking of jewelry and novelties of silver.
(E)119.[1] Dial indicators (for linear measurements).
120. Standard stock ponderosa pine doors.
121. Women's slip sizes (woven fabrics).
122. Western softwood plywood.
123. Grading of diamond powder.
(E)124.[1] Master disks.
125. Prefabricated homes.
126. Tank-mounted air compressors.
127. Self-contained mechanically refrigerated drinking water coolers.
128. Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).
129. Materials for safety wearing apparel.
130. Color materials for art education in schools.
131. Industrial mineral wool products, all types—testing and reporting.
132. Hardware cloth.
133. Woven wire netting.
134. Cast aluminum cooking utensils (metal composition).
135. Men's shirt sizes (exclusive of work shirts).
136. Blankets for hospitals (wool, and wool and cotton).
137. Size measurements for men's and boys' shorts (woven fabrics).
138. Insect wire screening.
139. Work gloves.
140. Testing and rating convectors.
141. Sine bars, blocks, plates, and fixtures.
142. Automotive lifts.
143. Standard strength and extra strength perforated clay pipe.
144. Formed metal porcelain enameled sanitary ware.

CS No.

145. Testing and rating hand-fired hot-water supply boilers.
146. Gowns for hospital patients.
147. Colors for molded urea plastics.
148. Men's circular flat- and rib-knit rayon underwear.
149. Utility type house dress sizes.
150. Hot rolled rail steel bars (produced from tee-section rails).
151. Body measurements for the sizing of apparel for infants, babies, toddlers, and children (for the knit underwear industry).
152. Copper naphthenate wood-preservative (spray, brush, dip application).
153. Body measurements for the sizing of apparel for girls (for the knit underwear industry).
154. (Reserved for "Wire rope.")
155. Body measurements for the sizing of boys' apparel (knit underwear, shirts, trousers).
156. Colors for polystyrene plastics.
157. Ponderosa pine and sugar pine plywood.
158. Model forms for girls' apparel.
159. Sun glass lenses made of ground and polished plate glass, thereafter thermally curved.
160. Wood-fiber blanket insulation (for building construction).
161. "Standard grade" hot-dipped galvanized ware (coated after fabrication).
162. Tufted bedspreads.
163. Standard stock ponderosa pine windows, sash and screens.
164. (Reserved for "Concrete mixers.")
165. Zinc naphthenate wood-preservative (spray, brush, dip application).
166. Size measurements for men's work trousers.
167. Automotive and general service copper tube.
168. Polystyrene plastic wall tiles, and adhesives for their application.
169. Galvanized ware fabricated from *pregalvanized* steel sheets.
170. Cotton flour-bag (sack) towels.
171. Hardwood veneered doors.
172. Brass trim for water-closet bowls, tanks, and urinals (dimensional standards).
173. Heavy-duty alpha-cellulose-filled melamine tableware.
174. 140-F dry-cleaning solvent.
175. Circular-knitted gloves and mittens.
176. Prefinished wall panels.
177. Bituminous-coated metal septic tanks (single compartment, residential).
178. Testing and rating ventilating fans (axial and propeller types).
179. Installation of attic ventilation fans in residences.
180. Model forms for boys' apparel.
181. Water-resistant organic adhesives for installation of clay tile.
182. Latex foam mattresses for hospitals.
183. Boys' trouser size measurements.
184. Steel fence posts—field and line type (produced from hot-rolled steel sections).
185. Wool felt.

[1] Where "(E)" precedes the CS number, it indicates an emergency commercial standard, drafted under war conditions.

U. S. DEPARTMENT OF COMMERCE

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Butte, Mont.
306 Federal Bldg.
Charleston 4, S. C.
Area 2, Sergeant Jasper Bldg.
Cheyenne, Wyo.
308 Federal Office Bldg.
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Cincinnati 2, Ohio
105 W. Fourth St.
Cleveland 14, Ohio
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Dallas 2, Tex.
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Denver 2, Colo.
142 New Custom House
Detroit 26, Mich.
1214 Griswold St.
El Paso, Tex.
310 San Francisco St.
Hartford 1, Conn.
135 High St.
Houston, Tex.
430 Lamar St.
Jacksonville 1, Fla.
311 W. Monroe St.
Kansas City 6, Mo.
903 McGee St.
Los Angeles 15, Calif.
112 W. 9th St.
Louisville 2, Ky.
631 Federal Bldg.
Memphis 3, Tenn.
229 Federal Bldg.
Miami 32, Fla.
36 NE. First St.
Milwaukee 2, Wis.
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Minneapolis 2, Minn.
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Mobile 10, Ala.
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1114 Market St.
Salt Lake City 1, Utah
109 W. Second St., South
San Francisco 2, Calif.
870 Market St.
Savannah, Ga.
125–29 Bull St.
Seattle 4, Wash.
123 U. S. Court House

For local telephone listing, consult section devoted to U. S. Government

U. S. GOVERNMENT PRINTING OFFICE: 1952

DEPARTMENT OF COMMERCE

National Bureau of Standards

VOLUNTARY PRODUCT STANDARDS

Notice of Action on Proposed Withdrawal

In accordance with § 10.12 of the Department of Commerce Procedures for the Development of Voluntary Product Standards (15 CFR Part 10, as amended; 35 F.R. 8349 dated May 28, 1970), notice is hereby given of the withdrawal of 111 Voluntary Product Standards identified below, including 78 standards identified as "Simplified Practice Recommendations" (R), and 33 standards previously identified as "Commercial Standards" (CS). Each of these standards has been found to be obsolete, technically inadequate, no longer acceptable to and used by the industry, or otherwise not in the public interest.

Public notice of the Department's intention to withdraw these standards was published in the FEDERAL REGISTER on February 10, 1971 (36 F.R. 2813), and a 45-day period was provided for the submission of comments or objections concerning the proposed withdrawal of any of these standards. No objections to the Department's intention of withdrawing any of these standards have been received by the National Bureau of Standards.

The effective date for the withdrawal of these standards will be 60 days after the publication of this notice. This withdrawal action terminates the authority to refer to these standards as Voluntary Product Standards developed under the Department of Commerce Procedures.

R 4-36___ Asphalt.
R 8-50___ Ferrous range boilers, expansion tanks, and solar tanks.
R 9-47___ Galvanized woven-wire fencing and barbed wire.
R 19-37___ Asbestos paper and asbestos millboard.
R 21-46___ Lavatory and sink traps.
R 23-54___ Plow bolts.
R 26-50___ Steel reinforcing bars.
R 35-44___ Steel lockers.
R 38-37___ Sand-lime brick.
R 49-26___ Sidewalk, floor, and roof lights.
R 59-27___ Rotary-cut lumber stock for wire-bound boxes.
R 63-28___ Metal spools (for annealing, handling and shipping wire).
R 65-31___ Packaging of overhead electric railway material.
R 67-36___ Taper roller bearings.
R 68-41___ Metal and nonconducting flashlight cases.
R 69-27___ Packaging of razor blades.
R 71-28___ Turnbuckles.
R 74-49___ Hospital and institutional cotton textiles.
R 75-29___ Composition blackboard.
R 80-28___ Folding and portable wooden chairs.
R 82-28___ Hollow metal single-acting swing doors, frames and trim.
R 83-28___ Kalamein single acting swing doors, frames, and trim.
R 88-37___ Floor sweeps.
R 89-55___ Coated abrasive products.
R 92-38___ Hard fiber twine and lath yarn (ply and yarn goods).
R 93-39___ Paper shipping tags.
R 94-53___ Open-web steel joists and open-web mailer steel joists.
R 95-30___ Skid platforms.
R 97-47___ Bell-bottom screw jacks.
R 101-40___ Metal partitions for toilets and showers.
R 102-33___ Granite curbstone.
R 105-32___ Wheelbarrows.
R 107-31___ Glassine bags.
R 110-29___ Soft fiber (jute) twine.
R 112-29___ Elastic shoe goring.
R 115-30___ Full-disk buffing wheels.
R 119-31___ Fast-selvage terry towels.
R 122-31___ Wire insect-screen cloth.
R 123-43___ Carbonated beverage bottles.
R 124-31___ Polished cotton twine.
R 126-41___ Set-up paper boxes (used by department and specialty stores).
R 127-41___ Folding paper boxes (used by department and specialty stores).
R 128-41___ Corrugated fiber boxes (used by department and specialty stores).
R 131-35___ Glass containers for mayonnaise.
R 138-32___ Dental rubber (base and veneering).
R 145-33___ Packaging of electric railway motor and controller parts.
R 154-38___ Cupola refractories.
R 156-41___ Extracted honey packages.
R 158-42___ Forged axes.
R 159-42___ Forged hammers.
R 160-42___ Forged hatchets.
R 161-35___ Packaging of automotive (bus) engine parts.
R 166-37___ Color code for marking steel bars.
R 169-45___ Bolts and nuts (stock production sizes).
R 171-38___ Wooden boxes for canned fruits and vegetables.
R 172-54___ Stock folding boxes for garments and dry cleaning.
R 177-41___ Single-faced corrugated-board rolls (used by department and specialty stores).
R 178-41___ First-aid unit dressings and treatments (packaging of).
R 181-41___ Nonferrous range boilers.
R 188-54___ Spring and slotted clothespins (sizes and packaging).
R 189-42___ Round and flat hardwood toothpicks (sizes and packaging).
R 196-42___ Glass containers for green olives.
R 199-43___ Cloth window shades.
R 201-43___ Iron and steel pop safety valves.
R 202-48___ Tank-mounted air compressors (¼ to 10 horsepower).
R 203-44___ Containers and packages for household insecticides (liquid spray type).
R 204-44___ Bronze pop safety valves, and bronze, iron and steel relief valves.
R 205-44___ Iron and steel relief valves for petroleum, chemical and general industrial services.
R 209-45___ Peanut butter packages and containers.
R 212-45___ Cast brass solder-joint fittings.
R 215-46___ Luggage (trunks and suitcases).
R 219-46___ Automatic regulating valves.
R 232-48___ Low-pressure lubricating devices.
R 233-48___ Rotary files and burs.
R 234-48___ Welded-wire fabric reinforcement concrete pipe.
R 249-52___ Plastic tableware.
R 253-54___ Retail container sizes for frozen fruits and vegetables.
R 266-63___ Gypsum board products.
CS 3-40___ Stoddard solvents (dry cleaning).
CS 7-29___ Standard weights malleable iron or steel screwed unions.
CS 19-32___ Foundry patterns of wood.
CS 32-31___ Cotton cloth for rubber and pyroxylin coating.
CS 36-33___ Fourdrinier wire cloth.
CS 48-40___ Domestic burners for Pennsylvania anthracite (underfed type).
CS 56E-41___ Oak flooring (exports).
CS 59-44___ Textiles-testing and reporting.
CS 62-38___ Colors for kitchen accessories.
CS 63-38___ Colors for bathroom accessories.
CS 68-38___ Liquid phyochlorite disinfectant, deodorant, and germicide.
CS 93-50___ Portable electric drills (exclusive of high frequency).
CS 94-41___ Calking lead.
CS 95-41___ Lead pipe.
CS 96-41___ Lead traps and bends.
CS 102E-42___ Diesel and fuel-oil engines (export classifications).
CS 108-43___ Treading automobile and truck tires.
CS 110-43___ Tire repairs—vulcanized (passenger, truck, and bus tires).
CS 112-43___ Homogeneous fiber wallboard.
CS E124-45___ Master disks.
CS 126-56___ Tank-mounted air compressors (classification and testing).
CS 130-47___ Work gloves.
CS 154E-49___ Wire rope (export classifications).
CS 164E-50___ Concrete mixers (export classifications).
CS 170-50___ Cotton flour-bag (sack) towels.
CS 175-51___ Circular-knitted gloves and mittens.
CS 179-51___ Installation of attic ventilation fans in residences.
CS 181-52___ Water-resistant organic adhesives for installation of clay tile.
CS 212-57___ Steel sliding closet door and frame units.
CS 213-57___ Steel knockdown sliding closet door units (for wood frame installation).
CS 221-59___ Gel-coated glass-fiber-reinforced polyester resin bathtubs.
CS 222-59___ Gel-coated glass-fiber-reinforced polyester resin shower receptors.
CS 229-60___ Copper drainage tube (DWV).

LEWIS M. BRANSCOMB,
Director.

APRIL 15, 1971.

Approved: April 19, 1971.

JAMES H. WAKELIN, Jr.,
Assistant Secretary for Science and Technology.

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